



## Charles Kao, Life Fellow of IEEE wins Nobel for Physics 2009

Dr. Charles Kao is IEEE Life Fellow and IEEE Alexander Graham Medal winner! Now shares 50% of 2009 Nobel Prize money for his groundbreaking achievements concerning the transmission of light in fibers

for optical communication, with the other half jointly for Willard S. Boyle and George E. Smith of Bell Laboratories, Murray Hill, NJ, USA for *the invention of an imaging semiconductor circuit or the CCD sensor.*



*Charles K. Kao of Standard Telecommunication Laboratories, Harlow, UK and Chinese University of Hong Kong today (left) and when he made the invention in the 1960s.*



In 1966, **Charles K. Kao** made a discovery that led to a breakthrough in fiber optics. He carefully calculated how to transmit light over long distances via optical glass fibers. With a fiber of purest glass it would be possible to transmit light signals over 100 kilometers, compared to only 20 meters for the fibers available in the 1960s. Kao's enthusiasm inspired other researchers to share his vision of the future potential of fiber optics. The first ultra pure fiber was successfully fabricated just four years later, in 1970.

Today optical fibers make up the circulatory system that nourishes our 'communication society'. These low-loss glass fibers facilitate global broadband communication such as the Internet. Light flows in thin threads of glass, and it carries almost all of the telephony and data traffic in each and every direction. Text, music, images and video can be transferred around the globe in a split second.

A large share of the traffic is made up of digital images, which constitute the second part of the award. In 1969 **Willard S. Boyle** and **George E. Smith** invented the first successful imaging technology using a digital sensor, a CCD (Charge-Coupled Device). The CCD technology makes use of the photoelectric effect, as theorized by Albert Einstein and for which he was awarded the 1921 year's Nobel Prize. By this effect, light is transformed into electric signals. The challenge when designing an image sensor was to gather and read out the signals in a large number of image points, pixels, in a short time. The CCD is the digital camera's electronic eye. It revolutionized photography, as light could now be captured electronically instead of on film.

### IEEE CODE OF ETHICS

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree: .....

10. To assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

### Congrats Ramalatha Marimuthu!

IEEE Member and Geographic Activities Department has communicated that Mrs. Ramalatha Marimuthu of Madras Section, IEEE R10 WIE Coordinator, has been selected as the 2008 Outstanding Student Branch Counselor. Congratulations on behalf of the Chairman and members of India Council and the Editorial Board for this great achievement!



### Editorial Board

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visit: [http://www.ewh.ieee.org/r10/india\\_council](http://www.ewh.ieee.org/r10/india_council)

## Chairman's Message



Dear Members,

With a little over two months left to conclude this year's activities, we would like to utilize the NDLP grant from HQ. Sections and other entities organizing seminars and conferences are requested to avail this scheme for inviting reputed speakers for their events. Please contact Dr. G. Sai Narayanan and send your proposals to him at <sai.jgk@gmail.com>

IEEE Bangalore Section is organizing Women in Engineering Congress WIE'CON '09 on 23-24 October 2009 hosted by Sri Venkateswara College of Engineering, NH 7, Vidya Nagar Cross, Near Yelahanka Air force Station NH 7, Bangalore. The theme of the congress is 'Meeting the global challenges of the next generation'. More than 50 delegates from Asia Pacific, Africa, Europe and America are registered and participating in the event. WIE Chair, Dr. Karen Panetta has kindly consented to honor the occasion and many eminent women professionals will share their thoughts and experiences. Bangalore Section and GOLD Chapter together are organizing GOLD Congress on 5-6 December 2009 at Bangalore. For details on both the events, please visit [www.ieeebangalore.org](http://www.ieeebangalore.org).

**May I remind you that it is time for renewal of your valuable membership by paying the annual dues at the earliest!**

Prof. Moshe Kam has been elected as the IEEE President-elect 2010 in the recently concluded IEEE Annual elections. The IEEE India Council congratulates Prof. Kam on being elected. The India Council's premier event of the year is INDICON which is being held at DA-ICT, Gandhinagar, Ahmedabad, Gujarat on 18-20 December 2009.

On behalf of IEEE India Council and Sections, I extend our heartfelt congratulations to Prof. Ramalatha Marimuthu on receiving the 2008 Outstanding Student Branch Counselor Award. Her achievements are outstanding as R10 WIE Coordinator & Chair, WIE IEEE Chennai Section and Student Branch Counselor.

It is a festival season starting from Dussehra, Deepavali and ending with Christmas and New Year Eve. I wish all the members joy, prosperity, and peace for the festival season.

With warm regards,

Bangalore  
01 October '09

**Kasi Rajgopal**  
Chairman, IEEE India Council  
[kasi.rajgopal@ieee.org](mailto:kasi.rajgopal@ieee.org)

## New Face of Engineering: Date Extended

### IEEE Staff & Volunteers!

The deadline for nominations to the IEEE / IEEE-USA's New Face of Engineering has been extended to Oct. 20. To nominate a deserving engineer under 30 and get more information, see <http://www.ieeeusa.org/communications/releases/2009/091109.asp>.

## From India Council Secretary



Dear All,

Warm Greetings from India Council! Hope most of you have exercised the vote to elect the right candidate as IEEE future leader. The on-line membership registration/renewal site of IEEE is opened for making payment of 2010 dues. You may be aware that now the new subscription for fresh membership will not only make you the valid IEEE member through 2010 but also get the benefit of membership for rest of 2009. In view of this, I earnestly urge one and all to renew the IEEE membership dues for 2010 on priority and also advise interested friends and colleagues to become part of the prestigious IEEE world wide technical and professional community.

We invite interested regular and high grade IEEE members to match their interests and come forward to contribute / serve in IEEE volunteer activities by writing to the Local Section Chairman/Secretary or the India Council Chairman/Secretary. **I have a special reference and request to those volunteers who are interested to serve on the Editorial Board of this India Info monthly newsletter of India Council.** Brief particulars with the relevant experience and interest in IEEE may be forwarded to the Secretary, India Council by 1<sup>st</sup> November 2009.

India Council also invite your active participation in the forthcoming events of IEEE which include Women Engineering Congress being organized at Bangalore on 23-24 October 2009, GOLD Congress on 5-6 December 2009 at Bangalore and INDICON 2009 on 18-20 December 2009 at Ahmedabad.

Yours sincerely

**K Ramakrishna**

Secretary

Email: [kramakrishna@ieee.org](mailto:kramakrishna@ieee.org)

### Online Video Competition

\$5,000 in scholarship prizes for undergraduates and a paid summer internship for undergraduates / graduates in engineering/technology. Link to pdf at: <http://www.ieeeusa.org/communications/files/vid-massmedia.pdf>.

Application deadline: Friday, 15 January 2010.

### Padmabhooshan Thomas Kailath in Kerala

Prof. Thomas Kailath (IEEE Spectrum May 2007 carried an article on him – "The man who loved Algorithms" with his photo on the cover), America Hitachi Professor (Emeritus), Stanford University, California and world renowned Scientist, is visiting Thrissur, Kerala to deliver the inaugural keynote address in the International Conference EPSCICON 2010 (International Conference on Power, Controls, Signals and Computation 3-6 Jan 2010) organized by Vidya Academy of Science & Technology, Thrissur.

**The best way to win an argument is to begin by being right - Jill Ruckelshaus**

## Technology Notes

### ECO-ASIA Program to Reduce Carbon Foot Print

The USAID ECO-Asia program, in cooperation with the World Bank and the Global Environment Facility, has provided technical assistance to Chinese and Indian utilities to help them design improvements and secure loans to renovate plants. It is now estimated that these improvements and renovations will result in efficiencies that will reduce these plants' emissions by over 18 million metric tons of CO<sub>2</sub> – the equivalent of taking 500,000 cars off the road.

### Recovery after Slump in RE spending

Global investment in renewable energies and energy efficiency was hit by the financial crisis in late 2008 and early 2009, but is now showing signs of a strong recovery. The report notes a significant slowdown in investment in the 2nd half of 2008 (-10% in the 3<sup>rd</sup> quarter; -23% in the 4<sup>th</sup>), that continued in the first quarter of 2009 (-47% compared with the 4<sup>th</sup> quarter of 2008), but started to reverse in the 2<sup>nd</sup> quarter (+83% compared with the 1<sup>st</sup> quarter of 2009).

### Solar Modules Production Doubled World-wide

The European Commission's Joint Research Centre published its 8<sup>th</sup> Annual Photovoltaics Status Report last fortnight, indicating that PV production in the world increased to about 7.3 GW in 2008 - an 80% rise on the previous year. Europe's production of solar cells rose from 1.1 GW to 1.9 GW, while the installed capacity increased threefold to 4.8 GW, mainly led by Spain, where figures multiplied almost 5 times from 560 MW in 2007 to 2.5-2.7 GW. The cumulative installed PV electricity generation capacity in the world was around 15 GW, with Europe accounting for more than 60% of this (9.5 GW).

### China leading PV Production

In 2008, China became the leading producer of solar cells with an annual production of about 2.4 GW, followed by Europe with 1.9 GW, Japan with 1.2 GW and Taiwan with 0.8 GW. If this trend continues, China might have about 32% of the world-wide production capacity by 2012. An increasing number of producers are entering the PV market.

In 2008, thin-film solar modules have reached 12-14% of the market share. Concentrating photovoltaic (CPV) is an emerging market with approximately 17 MW in 2008 of cumulative installed capacity.

### "n-type" silicon solar cells boost efficiencies

Researchers at the Fraunhofer Institute for Solar Energy Systems ISE (Freiburg, Germany) have developed new methods and cell concepts for the manufacture of n-type silicon solar cells. As a result, higher efficiencies and power production levels are also possible for commercial solar cells. The prototype exceeded an efficiency of 23%. Most commercial silicon solar cells are currently p-types.

The new n-type silicon used for solar cell structures developed at ISE has better properties for photovoltaic electricity production, such as greater tolerance for most impurities. In practice, there are two options: either greater efficiency or lower manufacturing costs because you can use less expensive silicon. In addition, p-type Czochralski (Cz) silicon suffers from light-induced degradation, which does not occur with n-type silicon.

### Shrimp Shell as Biofuel Catalyst

Shrimp shells can catalyze the conversion of plant oils into biofuels and the process is fast, cheap and environment friendly. For this shrimp shells are heated till they turn porous. These were then loaded with Potassium fluoride to make them catalytic. This can convert 89% of plant oil into biodiesel in 3 hours. Traditional catalysts consist of expensive elements like Rhodium which can be used only once, unlike the shrimp shells. (Source: *Energy & Fuels, American Chemical Society*)

### Bacterium generates Electricity from Wastes

Fuel cells which converts chemical energy to electricity using microorganisms is no news. This route was considered one of the clean routes to future energy. Microbes which can generate electricity from mud and wastewater were known. But now, work of Dereck Lovely and his team at MIT, USA has proven a way to increase their output. The microbe *Geobacter* found in Potomac River is known since 1987. The team's finding is that they have set sights on a new strain of microbe that can give 8 times the output. (Source: *Biosensors and Bioelectronics, 9/09*)

## IEEE FOCUS

### Humanitarian Technologies at IEEE

**HTC at 125 Yrs celebrations at Bangalore:** A Humanitarian Technology workshop was held by the India Initiative group on the day previous to the 125 years celebrations at Bangalore. Dr. John Vig, Dr. Lew Terman, Dr. Richard Gowen, Dr. Kasturi and many other dignitaries from IEEE and some NGOs were present on the occasion. Dr. Kasturi and Dr. Anil Roy put in great efforts to organize the function – Amarnath Raja writes.

HTC has started a survey of humanitarian projects. Some of them will be chosen for implementation of the "Three Challenges". Please send any proposals you have to [h.tepper@ieee.org](mailto:h.tepper@ieee.org). If you need further assistance in this, please notify. For continuing interactions, we are starting a "Page" on the Face book named: "IEEE Humanitarian Technology (R10)". If you are on face book, please join the forum by becoming a FAN of the page. Do visit <http://www.facebook.com/pages/Asia-Pacific/IEEE-Humanitarian-Technology-R10/149643600773?ref=nf>

### Nominations Sought for IEEE Fellows

Do you know an IEEE senior or IEEE life senior member who has

made significant contributions that have advanced engineering, science, and technology? If you are in government, industry, or academia, you can nominate that person as an IEEE Fellow in one of four categories: application engineer/practitioner, educator, research engineer/scientist, or technical leader. You have until 1 March 2010 to nominate someone at <http://www.ieee.org/web/aboutus/visionmission.html>

### IEEE Green Technology Conference Seeks Technical Papers

Organizers of the second IEEE Green Technology Conference (<http://www.ieeegreentech.org>) are seeking technical papers on topics related to current and emerging renewable energy sources and energy-reduction technologies.

Accepted papers will be presented during the conference, 15-16 April 2010 at the Gaylord Texan Hotel and Convention Center in Grapevine, Texas, between Dallas and Fort Worth. They will also be published in a conference proceedings CD and available through the digital library IEEE Xplore ([http://ieeexplore.ieee.org/guide/g\\_oview\\_faq.jsp](http://ieeexplore.ieee.org/guide/g_oview_faq.jsp)).

**An eye for eye only ends up making the whole world blind – Gandhiji**

## Editorial



### On Info

The genesis of this Bulletin - now known as the IEEE India Info - has a history of nearly two decades. It has almost all along been published from Trivandrum, always helped by the Kerala Section in abundance. On advertisements secured Bombay followed by Delhi were the saviours. Further, it so happened that the Editorship was handled initially by N T Nair, former Chair IC and currently the Publisher and followed by me, and repeating the cycle again for around 17 years in total. It has registration for postal concession in Trivandrum and the issues were, but for a few issues in mid-90s, punctual and regular in spite of the financial strain it always had.

Looking back, there were strong views from certain Sections against contributing one month's expenses for it, as well as on the utility of it in the printed form. Some prefer it only as a digital version. Currently, the monthly issues are on the IC web pages for the web savvy to browse through. Yet, there are a large number of silent members who feel that they are far from the Section arenas and the only tangible reporting on what goes on in IEEE India, is thro' the Bulletin - a capsule of 4 pages with some photos sprinkled here and there. As Editor, I am aware that many happenings in this front never get reported to the Bulletin. Yet, it is true that a journal is an organizer, and that is why some journals are called "Organ of ....."

We invite the attention of our members who are readers of this Info to the announcement of the Secretary, IC (*see page 2*), seeking volunteers to the new Editorial Board, as per our request. Nair and I are fully aware of the need for us to bow out and allow fresh blood to breathe novelty to this publication as well as to develop it into a true binding force and organizer of IEEE in India, embracing all its Sections, Branches and Societies. IC has many talented writers, researchers and editors who could make Info more vibrant in the months to come. With the 2010 January issue, you can probably feel the change, with enthusiastic new volunteers carrying this torch further ahead. The present team wants to retire from publication job by December 2009.

Regards

Trivandrum  
12 October 2009

V K Damodaran  
Editor, vkd@ieee.org

## GOING GREEN

### Kenya Repents

Following decades of exploitation, Kenya is taking drastic measures to save its water resources. The government has unveiled plans to reforest the degraded Mau forest, the country's largest catchments area, and plant another 7.6 billion trees across the country over 20 years. Just 3% (and according to some others only 1.7%) of Kenya is covered by forest. This is telling upon the water availability in the country, especially in its capital city Nairobi. (Source: *Down to Earth* Sept 1-15)

### Biomass power to fetch Rs. 4.50

Tamil Nadu Electricity Regulatory Commission has allowed increased procurement price of Rs. 4.50 (against Rs 3.15 at present). This makes Biomass power tariff of TN to top the Indian scenario. Of the 683 MW of biomass power in the country, TN has 147 MW (the highest). This high price is to account for the increase in cost of biomass in the state.

### Solar Inverters

Delhi government is toying with the idea of encouraging or even enforcing use of solar charging of batteries connected to inverters and other back up power sources which are now very common. A 100 watt installation would need 1 m x 1 m area of collector and will cost Rs. 15,000. The fact that heavy drain on the grid results on account of automatic re-charging of batteries when power supply resumes after interruptions or scheduled load shedding, makes it an attractive idea to get these device off the shoulders of the otherwise overloaded grid.

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